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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
Victor A. Riley ) , Examiner: Brian T. Pendleton  
Serial No.: 09/644752 ) Group Art Unit: 2644  
Filed: August 23, 2000 ) Docket: H16-25959 (256.053US1)  
For: AUDIO FEEDBACK )  
REGARDING AIRCRAFT )  
OPERATION )

CORRECTED APPELLANTS' BRIEF ON APPEAL

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Mail Stop Appeal Brief  
Commissioner for Patents  
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Sir:

This Appeal Brief is presented in support of the Notice of Appeal filed on July 11, 2003 from the final rejection of claims 1, 4, 5 and 7-11 of the above-identified application, as set forth in the Final Office Action mailed March 3, 2003, the Advisory Action mailed May 29, 2003 and in response to the **Communication Regarding Correction of Appeal Brief mailed December 18, 2003.**

The Appeal Brief is filed in triplicate. The requisite fee of \$320.00 set forth in 37 C.F.R. § 1.17(c) was previously charged to Deposit Account 19-0743 when the first Appeal Brief was filed on September 11, 2003. It is believed that no requisite fee of \$320.00 is required. Please charge any required additional fees or credit overpayment to Deposit Account 19-0743.

An Extension of Time is included to respond to the Communication regarding Correction of Appeal Brief.



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APPELLANTS' BRIEF ON APPEAL

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### **1. REAL PARTY IN INTEREST**

The real party in interest of the above-captioned patent application is the assignee, HONEYWELL INTERNATIONAL INC.

### **2. RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences known to Appellant that will have a bearing on the Board's decision in the present appeal.

### **3. STATUS OF THE CLAIMS**

Claims 1-34 are currently pending. Claims 12-34 are allowed. Claims 2, 3 and 6 are objected to as depending from a rejected claim. Claims 1, 4, 5, and 7-11 have been finally rejected.

### **4. STATUS OF AMENDMENTS**

There are no amendments to the specification pending. An amendment adding new claims 35-38 was submitted on May 5, 2003, but was not entered. No other amendments have been presented after the Final Rejection of March 3, 2003.

### **5. SUMMARY OF THE INVENTION**

Audio feedback regarding the operation of an aircraft 100 is provided by microphones 245, 250 that are placed next to sound sources. (Summary, page 2, pages 3 and 4) The sound sources are components 120, 115, 215, 220, 225, 240, and 235 of the aircraft 100, such as an airframe 235, an engine 120, a flap 115, a brake 215, a gear 220, and a pump 225. For example, providing sound from the pump helps a pilot understand whether the pump is operating, and whether it is operating correctly. The pilot would otherwise be unable to hear the pump well if at all. It might also be reassuring to clearly hear landing gear lock. In one embodiment, a

microphone is placed near headsets 275, and used to provide noise cancellation such that sounds from the other microphones can be more easily heard. (Page 8, lines 4-14).

Audio inputs are received from the microphones and processed in accordance with settings, such as level, pan, and equalization in an automatic mixer 265. The automatic mixer mixes the sounds based on the settings and provides audio output 270, 275 to the pilot of the aircraft. The pilot can then manually 285 adjust the settings for the audio output to more effectively monitor the operations of the aircraft components, which might otherwise be difficult or impossible to hear. (Page 7, lines 5-28).

In yet a further embodiment, synthesized sounds 320, 260 corresponding to detected aircraft operation are added to the audio inputs. (Page 8, line 21 – page 9, line 7). Thus, a sound may be created for a component of the aircraft that does not normally generate sound based. Examples include a hydraulic operation, an electrical system operation, an aircraft control operation, and a fuel transfer operation. The synthesized sound can be associated with the component by the pilot.

## **6. ISSUES PRESENTED FOR REVIEW**

1. Whether claims 1, 4, 5, 7, 8 and 11 are patentable under 35 USC § 102(b) over Bellman, Jr. et al. (U.S. Patent No. 4,831,438).
2. Whether claims 1, 4, 5, and 7-10 are patentable under 35 USC § 103(a) over Tanis (U.S. Patent No. 5,406,487).
3. Whether claim 11 is patentable under 35 USC § 103(a) over Tanis (U.S. Patent No. 5,406,487) in view of Andersson (U.S. Patent No. 5,692,702).

## **7. GROUPING OF CLAIMS**

Claims 1, 4, 5, 8 and 11 are grouped together. All other claims are independent of each other, and each stands alone and are argued separately for purposes of this appeal.

## **8. ARGUMENT**

### **Rejection Under 35 U.S.C. § 102**

#### **1) *The Applicable Law***

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *M.P.E.P. '2131*. To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter. *PPG Industries, Inc. V. Guardian Industries Corp.*, 75 F.3d 1558, 37 USPQ2d 1618 (Fed. Cir. 1996). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

#### **2) *Discussion of the Rejection of the Claims Under 35 U.S.C. § 102(b) as being anticipated by Bellman, Jr. et al.***

The Examiner rejected claims 1, 4, 5, 7, 8 and 11 under 35 USC § 102(b) as being anticipated by Bellman, Jr. et al. (U.S. Patent No: 4,831,438).

At least one element of the claims is missing from Bellman, Jr. et al. Bellman, Jr. et al., describes a surveillance system that is clearly intended to monitor the activities of people for security purposes. It repeatedly refers to unauthorized entry into an area under surveillance and when an intrusion is sensed. See Col. 6, lines 56-60, and concealment of the system in an area under surveillance. Col. 8, lines 8-21. Microphones are placed to provide surveillance of people, or to provide noise cancellation. There is no teaching of placing microphones “adjacent to at least one aircraft component, wherein the at least one aircraft component is a sound source;” with an audio output that “indicates operation of the at least one aircraft component.” As claimed in claim 1. Since at least one element is missing from Bellman, Jr. et al., a prima facie case of anticipation has not been established, and the rejection should be overturned.

The examiner indicates in the response to arguments of the final office action that the airframe of Bellman, Jr. et al. is a sound source, and a specific aircraft component. This assertion is respectfully traversed. An airframe 105 is referenced in Bellman, Jr. et al. as something “to which aircraft components are affixed...” Col. 4, lines 3-7. It is not defined in Bellman, Jr. et al.

as a component, but something that has components affixed to it. Airframe noise is measured in Bellman, Jr. et al., to cancel it, not to indicate the operation of the airframe. In Bellman Jr. et al., since airframe noise is cancelled, it is not a component whose operation is indicated by the audio output as claimed in claim 1: “wherein the audio output indicates operation of the at least one aircraft component.” If sound from the airframe is cancelled, it cannot indicate operation of a component.

A prima facie case of anticipation has not been established since the rejection relies on the airframe being characterized as such a component. As such, its operation must be indicated by the audio output as claimed, but it clearly is not. Since at least one element of claim 1 is clearly missing in Bellman Jr. et al., the rejection should be withdrawn.

Claims 4, 5, 7, 8 and 11 depend from claim 1 and distinguish Bellman, Jr. et al. for at least the same reasons as claim 1.

Claim 7 recites “overriding the automatic mixer with a manual mixer”. The Examiner, in the Final Office Action mailed March 3, 2003 indicates “Regarding claim 7, there is disclosed an audio processor 435.” This rejection is respectfully traversed. The elements of the claim have not been addressed in the rejection by a mere reference to an audio processor 435. There is no teaching in Bellman, Jr. et al. that the audio processor 435 contains both an automatic mixer and a manual mixer. Volume control 435, as characterized by Bellman, Jr. et al., “...controls the level of the output of an audio amplifier and processor 436, which drives a speaker 437...The audio amplifier and processor 436 may include a frequency equalizer for adjusting the relative strengths of different frequency components of the audio signal.” Col. 10, lines 54-61. Claim 1, from which claim 7 depends refers to “mixing the audio inputs”. Thus, separate audio inputs are mixed either automatically or manually. Bellman, Jr. et al. uses a switch means 180 to route signals from the various sensors. Bellman, Jr. et al. does not mix audio inputs as claimed in claim 1, and further does not teach or suggest doing so automatically or manually as recited in claim 7.

#### **Rejections Under 35 U.S.C. § 103**

**1) The Applicable Law**

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). To do that the Examiner must show that some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art would lead an individual to combine the relevant teaching of the references. *Id.*

The court in *Fine* stated that:

Obviousness is tested by "what the combined teaching of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 878 (CCPA 1981)). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys.*, 732 F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined *only* if there is some suggestion or incentive to do so."

*Id.* (emphasis in original).

The M.P.E.P. adopts this line of reasoning, stating that

In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure.

*M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

An invention can be obvious even though the suggestion to combine prior art teachings is not found in a specific reference. *In re Oetiker*, 24 USPQ2d 1443 (Fed. Cir. 1992). At the same time, however, although it is not necessary that the cited references or prior art specifically suggest making the combination, there must be some teaching somewhere which provides the suggestion or motivation to combine prior art teachings and applies that combination to solve the

same or similar problem which the claimed invention addresses. One of ordinary skill in the art will be presumed to know of any such teaching. (See, e.g., *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988) and *In re Wood*, 599 F.2d 1032, 1037, 202 USPQ 171, 174 (CCPA 1979)).

The Office Action must provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding. *In re Sang Su Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002). Mere conclusory statements are unsatisfactory.

“With respect to Lee’s application, neither the examiner nor the Board adequately supported the selection and combination of the Nortrup and Thunderchopper references to render obvious that which Lee described. The examiner’s conclusory statements that ‘the demonstration mode is just a programmable feature which can be used in many different devices for providing automatic introduction by adding the proper programming software’ and that ‘another motivation would be that the automatic demonstration mode is user friendly and it functions as tutorial’ do not adequately address the issue of motivation to combine. This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill in the art would have been lead to this combination of references, simply to use ‘[use] that which the inventor taught against its teacher.’ *W.L. Gore V. Garlock, Inc.*, 721 F. 2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983).” *Lee*, at 1343, 1344.

The test for obviousness under § 103 must take into consideration the invention as a whole; that is, one must consider the particular problem solved by the combination of elements that define the invention. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). Furthermore, claims must be interpreted in light of the specification, claim language, other claims and prosecution history. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987), *cert. denied*, 481 U.S. 1052 (1987). At the same time, a prior patent cited as a § 103 reference must be considered in its entirety, “i.e. as a whole, including portions that lead away from the invention.” *Id.* That is, the Examiner must, as one of the inquiries pertinent to any obviousness inquiry under 35 U.S.C. § 103, recognize and consider not only the similarities but also the critical differences between the claimed invention



and the prior art. *In re Bond*, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990), *reh'g denied*, 1990 U.S. App. LEXIS 19971 (Fed. Cir. 1990). Finally, the Examiner must avoid hindsight. *Id.*

**2) *Discussion of the Rejection of claims 1, 4, 5, and 7-10 under 35 U.S.C. § 103(a) as being unpatentable over Tanis (U.S. 5,406,487)***

Claims 1, 4, 5, and 7-10 were rejected as being unpatentable under 35 USC § 103(a) over Tanis (U.S. Patent No. 5,406,487).

The Final Office Action refers to element reference number “2” in Tanis as being a microphone, and that “Audio input from the aircraft component is received at the microphone 2...” Actually, “the transducer 2 is of the ultrasonic type which generates pulses to the ground and receives echoes therefrom. The transducer produces an output in response to the echoes which is a function of the distance from the transducer to the ground.” Col. 3, lines 45-50. It should also be noted that transducer 2 is located in a position and arrangement that “prevents the transducer from responding to noise and vibration produced by the aircraft.” Col. 3, lines 38-41. Thus, the transducer specifically does not sense sound from an aircraft component, and does not provide an audio output that “indicates operation of the at least one aircraft component” as claimed in all claims 1, 4, 5 and 7-10.

Claim 1 also refers to a plurality of microphones. Tanis only describes a single microphone used to measure altitude. The Examiner indicates that since “aircraft have a plurality of components that need to be monitored during flight, one of ordinary skill would have been motivated to provide microphones at all the locations of aircraft components.” Given that the microphone in Tanis is for sensing altitude, Applicants see no reason the Tanis suggests including multiple microphones. The result would only measure the altitude of different parts of the aircraft. The rejection should be overturned.

The Examiner goes on to indicate that since the use of multiple microphones is obvious in Tanis, “the signals from the microphone would have to be mixed in order for the pilot to hear

them all.” It appears that the Examiner is taking official notice of at least two elements of claim 1, the multiple microphones, and the mixer. Such taking is respectfully traversed.

Since multiple elements of claim 1 are missing from Tanis, a colorable *prima facie* case of obviousness on the basis of a single reference has not been established, and the rejection should be overturned.

Claims 4, 5 and 7-10 also depend from claim 1 and are believed allowable for at least the same reasons. Regarding claim 7, the Examiner contends that automatic and manual mixers were well known at the time of the invention. Even if that were the case, there is no suggestion by the Examiner about overriding the automatic mixer as claimed.

Claim 8 indicates that multiple microphones are placed on different elements of the aircraft. The Examiner indicates that “the microphone is on the flap of the aircraft.” This statement does not address the claim, and is incorrect. “The transducer is mounted on the underside of the wing of the aircraft just forward of the wing flap...” Tanis, Col. 3, lines 26-28.

Claim 9 recites “adding synthesized sounds to the audio inputs, wherein the synthesized sounds correspond to detected aircraft operation.” The Examiner indicates that “the input signal from the transducer 2 synthesizes a sound.” Applicant fails to understand how this is the case. First of all, the “transducer provide an output in response to the echoes which is a function of the distance from the transducer to the ground.” Col. 3, lines 47-50. It should be noted that: “a tone generator circuit board 16 is connected with the display driver board 10 for generating an audio signal corresponding with the digital altitude signal...” Col. 3, line 67 to Col. 4, line 2. Such an audio signal is not added to audio inputs as claimed. Thus, this claim contains a further element not found in Tanis, and the rejection should be overturned.

Claim 10 recites different specific operational aspects of an aircraft, such as hydraulic operation, electrical system operation, aircraft control operation and fuel transfer operation. The Examiner indicates that Tanis has movement of the flap for landing as an aircraft control operation. The problem with this statement is that no sounds are synthesized for such an operation in Tanis, as claimed in claim 9, from which claim 10 depends. Since yet a further element is missing from Tanis, the rejection should be overturned.

3) ***Discussion of the Rejection of claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Tanis (U.S. 5,406,487) in view of Andersson (U.S. 5,692,702)***

Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanis (U.S. 5,406,487) in view of Andersson (U.S. 5,692,702). This rejection is respectfully traversed.

Claim 11 recites canceling noise from the audio inputs. There is clearly no need in Tanis to cancel noise, and in fact, canceling any noise in Tanis would clearly interfere with the sensing of altitude. The Examiner assumes that Tanis teaches “monitoring of the wing operation or generally for an aircraft component.” This is simply not true. There is no conceivable reason to combine the teaching of Tanis with Andersson to cancel noise to obtain a clean performance signal as stated by the Examiner.

## 9. SUMMARY

Applicant believes the claims are in condition for allowance and requests withdrawal of the rejections to claims 1, 4, 5, and 7-11, and of the objections to claims 2, 3 and 6. Reversal of the Examiner's rejections of claims 1, 4, 5, and 7-11 in this appeal is respectfully requested.

Respectfully submitted,

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By his Representatives,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Appeal Brief, Commissioner of Patents, P.O.Box 1450, Alexandria, VA 22313-1450, on this 8 day of January, 2004.

Name Gina Uphus

  
Signature

## **APPENDIX I**

### **The Claims on Appeal**

1. (Previously Presented) A method for providing audio feedback regarding the operation of an aircraft, comprising:
  - receiving audio inputs from a plurality of microphones, wherein the plurality of microphones are disposed adjacent to at least one aircraft component, wherein the at least one aircraft component is a sound source;
  - mixing the audio inputs; and
  - providing an audio output to a speaker in response to the mixing step, wherein the audio output indicates operation of the at least one aircraft component.
2. (Original) The method of claim 1, further comprising:
  - providing settings to the mixing step, wherein the settings are based on the audio inputs and a psycho-acoustic model.
3. (Original) The method of claim 2, further comprising:
  - determining masked signals based on the frequency and amplitude of the audio inputs and the psycho-acoustic model;
  - determining an unmasking strategy based on the masked signals; and
  - providing the settings based on the unmasking strategy.
4. (Original) The method of claim 1, wherein the speaker is an ambient speaker.
5. (Original) The method of claim 1, wherein the speaker is contained in a headset.
6. (Original) The method of claim 2, wherein the settings comprise:
  - at least one of level, pan, and equalization settings.

7. (Original) The method of claim 1, wherein the mixing step is accomplished via an automatic mixer, and further comprising:  
overriding the automatic mixer with a manual mixer, wherein the manual mixer comprises at least one of level, pan, and equalization control inputs.
8. (Previously Presented) The method of claim 1, wherein microphones are placed on multiple elements selected from the group consisting of:  
an airframe, an engine, a flap, a brake, a gear, a pump, and a cockpit.
9. (Original) The method of claim 1, further comprising:  
detecting an aircraft operation; and  
adding synthesized sounds to the audio inputs, wherein the synthesized sounds correspond to the detected aircraft operation.
10. (Original) The method of claim 9, wherein the aircraft operation comprises at least one of:  
a hydraulic operation, an electrical system operation, an aircraft control operation, and a fuel transfer operation.
11. (Original) The method of claim 1, further comprising:  
canceling noise from the audio inputs.
12. (Original) An aircraft, comprising:  
an airframe;  
at least one aircraft component coupled to the airframe; and  
an audio feedback system, comprising:

a plurality of microphones disposed adjacent to the at least one aircraft component,  
an analysis system that  
receives audio inputs from the microphones, and  
provides settings to an automatic mixer that mixes the audio inputs, wherein the recommended settings are based on the audio inputs and a psycho-acoustic model.

13. (Original) The aircraft of claim 12, wherein the analysis system further:  
determines masked signals based on the frequency and amplitude of the audio inputs and the psycho-acoustic model;  
determines an unmasking strategy based on the masked signals; and  
provides the settings to the automatic mixer based on the unmasking strategy.
14. (Original) The aircraft of claim 12, wherein the automatic mixer:  
mixes the audio inputs based on the settings; and  
provides the mixed audio inputs to a speaker.
15. (Original) The aircraft of claim 14, wherein the speaker is an ambient speaker.
16. (Original) The aircraft of claim 14, wherein the speaker is contained in a headset.
17. (Original) The aircraft of claim 12, wherein the settings comprise:  
at least one of level, pan, and equalization settings.
18. (Original) The aircraft of claim 12, wherein the audio feedback system further comprises:  
a manual mixer comprising level, pan, and equalization control inputs, wherein the manual mixer overrides the automatic mixer.

19. (Original) The aircraft of claim 12, wherein the aircraft component is one of:  
the airframe, an engine, a flap, a brake, a gear, a pump, and a cockpit.
20. (Original) The aircraft of claim 12, wherein the aircraft component is coupled directly to  
the airframe.
21. (Original) The aircraft of claim 12, wherein the aircraft component is coupled indirectly  
to the airframe.
22. (Original) The aircraft of claim 12, wherein the analysis system further:  
detects an aircraft operation; and  
adds synthesized sounds to the audio inputs, wherein the synthesized sounds correspond  
to the detected aircraft operation.
23. (Original) The aircraft of claim 22 wherein the aircraft operation comprises at least one  
of:  
a hydraulic operation, an electrical system operation, an aircraft control operation, and a  
fuel transfer operation.
24. (Original) An audio feedback system, comprising:  
at least one microphone for receiving sounds from at least one sound source; and  
an analysis system that  
receives audio inputs from the microphone, and  
provides settings to an automatic mixer that mixes the audio inputs, wherein the  
recommended settings are based on the audio inputs and a psycho-acoustic model.



25. (Original) The audio feedback system of claim 24, wherein the analysis system further:  
determines masked signals based on the frequency and amplitude of the audio inputs and the psycho-acoustic model;  
determines an unmasking strategy based on the masked signals; and  
provides the settings to the automatic mixer based on the unmasking strategy.
26. (Original) The audio feedback system of claim 25, wherein the automatic mixer:  
mixes the audio inputs based on the settings; and  
provides the mixed audio inputs to a speaker.
27. (Original) The audio feedback system of claim 26, wherein the speaker is an ambient speaker.
28. (Original) The audio feedback system of claim 26, wherein the speaker is contained in a headset.
29. (Original) The audio feedback system of claim 24, wherein the settings comprise:  
at least one of level, pan, and equalization settings.
30. (Original) The audio feedback system of claim 25 further comprising:  
a manual mixer comprising level, pan, and equalization control inputs, wherein the manual mixer overrides the automatic mixer.
31. (Original) The audio feedback system of claim 25, wherein the sound source is at least one aircraft component.

32. (Original) The audio feedback system of claim 31, wherein the aircraft component is at least one of:

an airframe, an engine, a flap, a brake, a gear, a pump, and a cockpit.

33. (Original) The audio feedback system of claim 24, wherein the analysis system further: detects aircraft operations; and

adds synthesized sounds to the audio inputs, wherein the synthesized sounds correspond to the detected aircraft operations.

34. (Original) The audio feedback system of claim 33 wherein the aircraft operations comprise at least one of:

hydraulic operations, electrical system operations, aircraft control operations, and fuel transfer operations.